

Short Note

Population structure of the grapsid crab, *Helice tridens latimera* (PARISI) in the Taiho mangrove, Okinawa, Japan

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**Abstract**

Grapsid crab *Helice tridens latimera* inhabiting mangroves, seashores as well as muddy and rocky areas. Ovigerous females were observed from December to May. Juveniles appeared in July and from December to April. In the laboratory they reached 9.50 mm in carapace width 4 months after hatching. It is likely that spawning of this crab occurs throughout the year.

**Key words:** *Helice tridens latimera*, Spawning, Juvenile

*Helice tridens latimera* PARISI, 1918 has so far been found in eastern Asia along the coasts of Japan, Taiwan and China (Miyake 1983, Dai and Yang 1991). This crab is common and dominant in Okinawan mangals. So far, no study has been carried out on this crab's population structure and reproductive cycle, but information exists on its larval development (Mia and Shokita 1997). The present study is a part of experiment aimed to assess the population structure of *H. t. latimera* including its breeding season, natural growth rates, abundance, and functional role in the shallow water community of the estuary of the Taiho River on Okinawa Island.

A population census of *Helice tridens latimera* was carried out monthly from May 1995 to April 1996 in the estuary of the Taiho River. Samples were collected by hand and using a scoop net in the mangrove stands, in areas surrounding gravel, and among the roots of trees. Collected specimens were sexed into three categories such as male, female and juvenile on the basis of their morphological differences of abdomen. Each individual was measured for carapace width (CW) using a vernier callipers to the nearest 0.1 mm. Females were inspected for the presence of eggs beneath their abdomen. After measurement each individual was released in the same area.

*Helice tridens latimera* were found running on the mangrove forest floor, in the shallow water, in gaps between the roots of trees, and inside holes, and they rarely appeared to settle down on mud. The monthly population census and structure of this species are shown in Figures 1 & 2. In all 343 males, 288 females including 8 ovigerous

females, and 22 juveniles were caught during one-year experimental period. The pooled male-female ratio was 1:0.84. The peak of males occurred in July, and that of females in October. CW varies from 13.20–35.50 mm in males, 14.30–34.00 mm in female, and 5.60–11.85 mm in juveniles. Ovigerous females with carapace widths of 15.00–24.55 mm appeared from December to May. Juveniles appeared in July and from December to April, and their peak was in February. The highest catch was in July, and the lowest in December. During December to April total catch per month was lower than in other months. Among all females ovigerous ones comprised 5% in May, 40% in December, 12.5% in January, 20% in February, and 14.25% in both March and April.

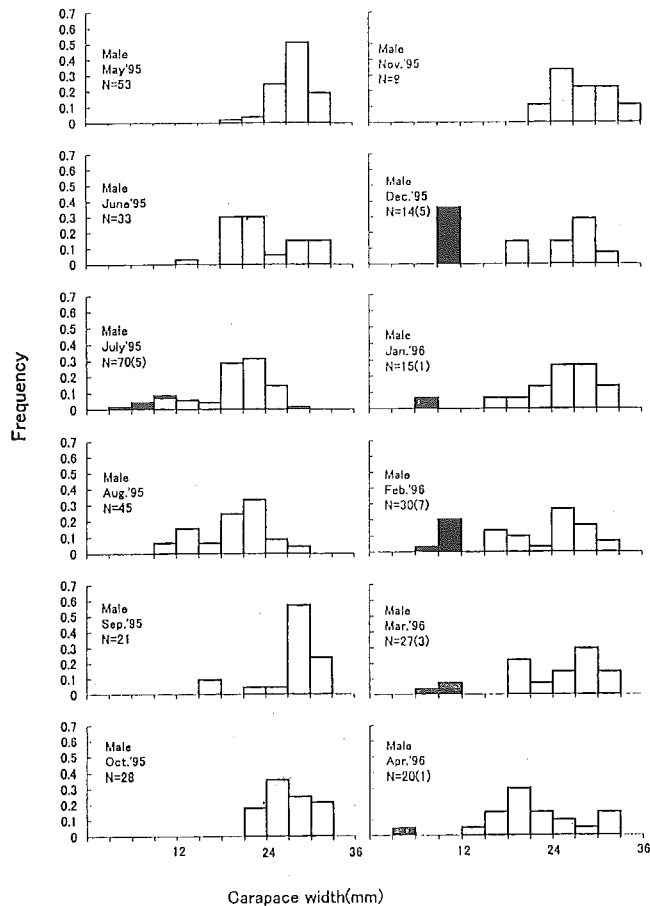


Fig. 1. Seasonal changes of the size distribution of *Helice tridens latimera* from May'95 to April'96. Figures in brackets and shaded bars indicate juveniles.

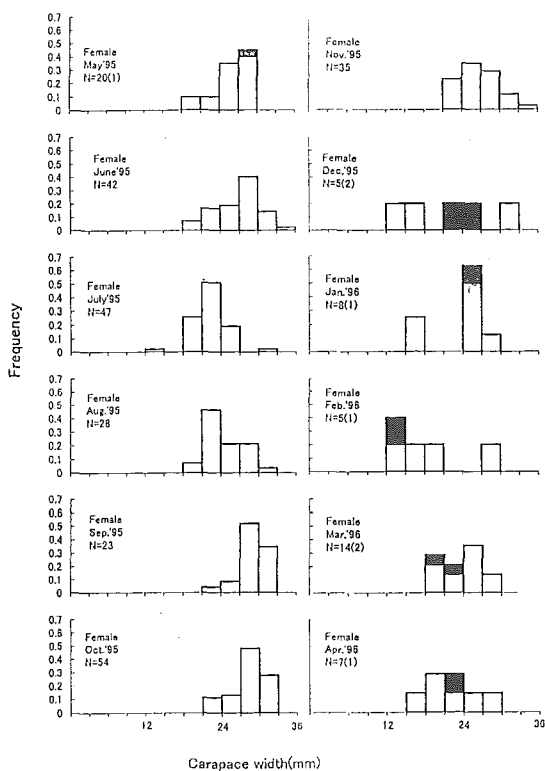


Fig. 2. Seasonal changes of the size distribution of *Helice tridens latimera* from May'95 to April'96. Figures in brackets and shaded bars indicate ovigerous females.

From the monthly population census data, it is clear that total catch was lower at low temperatures during the winter. Specimens of the sesarmid crab *Chasmagnathus convexus* stopped their activity when the air temperature fall below 13°C and became active at 16.2°C (Nakasone *et al.* 1982). The soldier crab *Mictyris longicarpus* rarely emerged when the sand temperatures were below 17°C (Kelemec 1979). Similar results for other crabs have been also reported by many authors (Hughes 1966, Sumpton and Smith 1990). It was reported that the body temperature of aquatic crustaceans must be close to that of the surrounding water (Edney 1960). Poikilothermal animals survive only within definite temperature ranges, and a change of external temperature results in a change of O<sub>2</sub> consumption. Similarly, the range of temperatures compatible with life is known to vary greatly between different species of poikilotherms (Florkin 1960). It was reported that the total catches of *Perisesarma bidens*, *Metopograpsus latifrons*, and *M. messor* were lower in winter than other seasons (Watanabe 1993, Windarti 1995). The results of the present study are consistent with their findings and suggest that during low temperature

*H. t. latimera* keep themselves hidden inside their burrows or migrate to warmer places that are suitable for their physiology.

Spawning of *Helice tridens latimera* perhaps occurs throughout the year. Although ovigerous females were caught from December to May, but this does not mean that spawning occurs only during these months. Juveniles were caught in July and from December to April, which suggests a longer spawning season. The average size of juveniles caught in July was 6.94 mm in CW. In laboratory experiments, larvae metamorphosed to juveniles (1.77 mm CW) 48 days and reached 9.50 mm in CW 4 months, respectively after hatching (Mia and Shokita 1997). Juveniles of 10.79 mm in CW were caught in December. No ovigerous females were caught from June to November, yet it is clear from the laboratory experiment that juveniles caught in December were about 4-5 months old. In conclusion, the present investigation revealed that spawning of *Helice tridens latimera* occurs throughout the year.

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